# ANTIOXIDANT POTENCIAL OF ETHANOLICS EXTRACTS OF TOMATO PLANT BY-PRODUCTS

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**Introduction**. The tomato belongs to the *Solanaceae* family and is a source of cheap food providing, phenolic compounds and antioxidants (1). In the agribusiness sector is discarded tomato plant left after harvesting, because they are considered worthless in the industry. As these increase the problem of waste disposal, environmental pollution and exacerbate problems generated with spreading plant pests on agricultural crops, since it is known that these crops produce biologically active secondary metabolites that may be suitable for use in food areas of interest.

The purpose of this study was to evaluate the antioxidant properties of fractions of two cultivar (Pitenza and Floradade) tomato plants, i.e., steam, root, leaves, whole plant fractions.

**Methods.** Fraction (stem, leaf, root, whole plant) were subjected to drying to 45 °C for 24 h, The plant were pulverized and 35 g of sample were mixed with a solution of ethanol and acetic acid solution (95:5 ratio). The maceration was carried out with stirring constantly for 72 h. The sample was extracted to exhaustion with acid-ethanol mixture by sonicating for 20 min. The solvents were eliminated using rotatory evaporator. Total phenols concentration were measured by the methods described by Singleton and Rossi (1965)(2) and total flavonoids was determinate utilized the method described by Zhishen *et al.* (1999)(3).The antioxidant capacity was measured *in vitro* by ABTS, and ORAC assays(4).

## Results

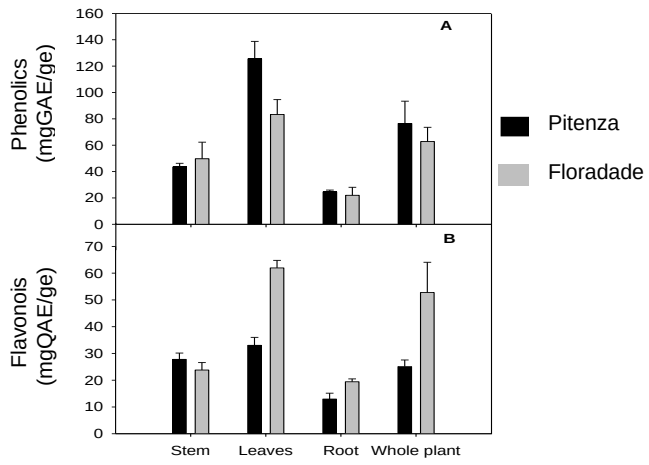


**Fig. 1** Total phenolic and flavonoids in extracts of tomato plant. (mgGAE/ge) (milligram galic acid equivalents. (mgQE/ge) (milligram quercetin equivalents)/ (gram of extract).

The values of total phenols and flavonoids between extracts of Pitenza and Floradade varieties are presented in (**Fig. 1A, 1B**). Higher values resulted for leaves extracts of two cultivars. Pitenza showed significantly higher of phenolic content when compared to other extracts. On the other hand roots extracts showed lowest content; this could be due to the roots don not important reservoir of these compounds.

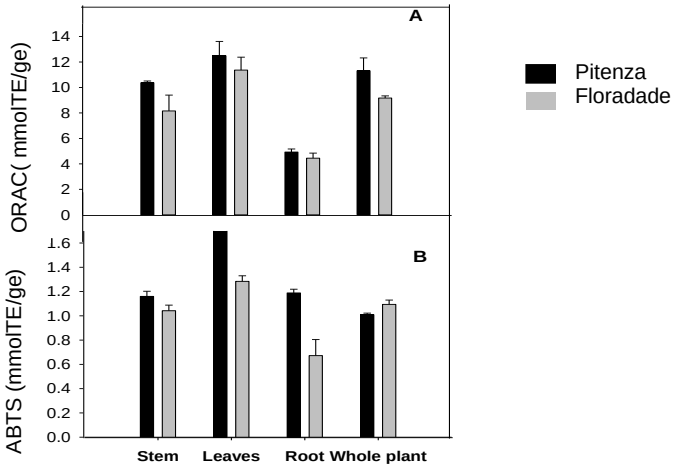


**Fig. 2** Antioxidant capacity measured in tomato plant extracts (mMol TE/ge) milimol trolox equivalent/gram of extracts.

The extracts of leaves of two varieties tomato showed the highest value of TE, followed by stem and whole plant extracts. The root extract showed the lowest antioxidant activity of tomato extracts included in this study (**Fig. 2A, 2B**). The high antioxidant capacity detected in leaves extracts could be related to the high mount of phytochemicals (4) (**Fig. 1A, 1B**).

**Conclusion.** The extracts from leaves of the two varieties showed the highest content of phytochemicals and high stability so that free radicals contribute significantly to activity and antioxidant capacity.

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## References

1. Friedman M. (2002). *J. Agric. Food Chem*. 50(21):5751-5780.
2. Singleton VL and Rossi Jr JA. 1965. *Am J Enol Viticul* 16(3):144-158.
3. Zhishen J, Mengcheng T.1999. *Food Chem* 64(4):55- 559
4. González-Aguilar GA, Villegas-Ochoa MA, Martínez-Téllez M, Gardea NA, Ayala-Zavala JF. 2007. *J Food Sci* 72(3):S197-S202.